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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

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LOCAL ANÆSTHETICS.

Local anæsthesia is coming more into use in everyday veterinary practice every year; and there are now probably few clinicians who do not employ it. But it must be admitted that the ideal local anæsthetic has yet to be found. We have many reliable local anæsthetics, but nearly all are more or less toxic; and cases of individual hypersensitiveness are not very rare. Cocaine has been longer in use, and is probably better understood, than any other drug injected for local anæsthesia. Many observers—Hobday in this country among them—have worked both clinically and experimentally to fix its safe dosage; and their results have established a scale which has long worked well in practice. But every now and then a case is recorded, like the Continental one we abstract this week, in which the dose has been far within the accepted limits of safety, and yet toxic symptoms have resulted. Probably not a few such cases occur unrecorded, not only with cocaine, but with most other local anæsthetics.

Urea and quinine, a local anæsthetic introduced comparatively recently, is probably the safest of all. But it has the disadvantage of slowness of action; and this, when operating away from home, is a serious drawback. On the other hand its effects are very prolonged, which is a great practical advantage in infirmary work. Urea and quinine is cheap, and we think it has a future before it till a better local anæsthetic—one at once quick, efficient, and safe—is found. Quinine alone is said to possess a local anæsthetic action not unlike that of its combination with urea. It seems possible that combinations of quinine with other drugs might give us what we require.

RESEARCH SCHOLARSHIPS.

The fact that the Board of Agriculture has awarded Research Scholarships in Agricultural and Veterinary Science to two of our last year's graduates shows that the profession is not being forgotten in the administration of Mr. Runciman's development scheme. The conditions—£150 per annum for three years—will do all that is required. They will maintain each scholar for a period long enough to produce useful work, at the end of which he should have developed into a trained and practised investigator—a thing quite different from the trained and practised clinician. Our record would have been better had the State always given our picked graduates the facilities it is now beginning to grant.

UNAIDED.

We print this week the remainder of an abstract of the paper by Prof. Meyer of the University of California, on Filterable Viruses, which in itself is little more than a summary of what has been done in this direction, with notes on some of the author's own work. Necessarily by far the larger part of the record is laboratory work, and experimental, and hence will appeal only indirectly to many of our readers. But there are incidentally several matters brought to notice in which all are interested. Of these is the nationality of the investigations. We find the continent largely represented, as one would expect, and they include Russia and Japan. California and South Africa have contributed; so, too, has Great Britain, but not in proportion to her place amongst the nations. The cause of this is, as we all know, primarily lack of funds for the purpose. Our State agricultural department is of quite recent growth, and develops but slowly, and financial assistance to the veterinary branch is yet of the smallest; whereas those of several of the continental states have been long established and suitably maintained. This national shortcoming may be put down to the enormous development of manufactures and commerce during the last hundred years, for at the commencement of the last century agriculture held the first place. Since then it has been tinkered with piecemeal by men who either failed to grasp the subject or worked only for one section of it. Recent developments are more promising—in spite of the multiplicity of teachers—and there is hope that veterinary science may come to its own. In veterinary practice we have probably little to learn from our neighbours.

Another question which naturally follows is—what of the men for this work? On this we have the assurance of the heads of our veterinary colleges that, given the necessary conditions, the men will not be wanting.

Many of the younger men in practice are now well in advance of the requisite minimum of scientific training, and it is recognised that the four years course does not go beyond a qualification to practise. Research work calls for the enthusiasm and energy of youth, and for personal liking and aptitude: but it is not necessary or even desirable, that the number exclusively engaged in this work should be large,

CALCULI IN DOUBLE COLON.

The two calculi as shown in the photograph were removed from the double colon of a cart gelding nine years old, after death. The horse had been in constant hard work to our knowledge for at least four to five years, and until last December we had no trouble with him in respect to colic. From that time until the horse died, Aug. 26, we have treated him possibly half-a-dozen times for slight colicy pains, and even up to the last the horse never had violent colic. But from the 17th to the 26th August there was very little fæces passed.

We could not detect by rectal examination any signs of obstruction.

The only interest attached to this case, which perhaps may be worth recording, is the fact of there being two calculi of practically equal size, weight, and shape. Each has 4 "facets" and it is obvious that both have been in constant contact, although on removal from the bowel they were separated about 18 inches. The weight of the two is 14lb. 2 oz., one being 2 ounces more than the other, and both measure at the widest part 6 inches as near as possible.

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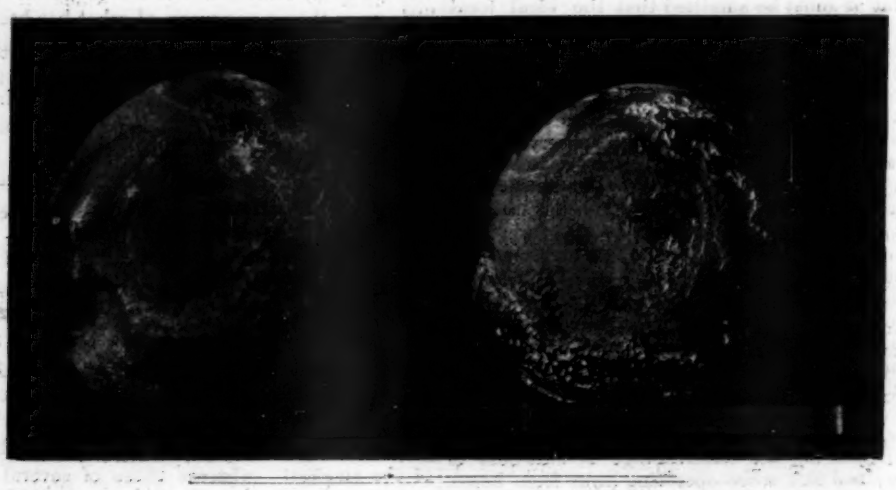

ABSTRACTS FROM FOREIGN JOURNALS.

EQUINE FILARIASIS.

D. Wirth (*Zeitschr. f. Infectionskr. Parasit. Krank. u. Hyg. d. Haust.*) after referring to the fact that he has already published descriptions of four cases of equine filariasis, proceeds to give details of a fifth case.

The case was brought to the clinique at the Veterinary High School at Vienna, in August, 1912, with a history that the animal had been dull for three months and had steadily lost its appetite. The temperature was subnormal and one micro-filaria was found in the blood.

Two months later the animal was under observation again, but in spite of repeated observations micro-filariæ were not found.

The hæmoglobin content of the blood was 75° on Sahli's scale; the red corpuscles numbered 9,792,000 and the white 13,760 per c.cm. Differential count of the white corpuscles gave the following percentages :— polynuclear neutrophiles 57, eosinophiles 8, lymphocytes 31, and mononuclears 4.

On the author's suggestion Bahnmuller carried out systematic examinations of horses for micro-filariæ and found 24 infected out of 280, the horses coming from different parts of Hungary. The following year 5 out of 75 animals were found to be infected.

It is probable that the severity of the symptoms depends on the number of parasites present in the blood. To what extent mechanical and toxic effects are responsible for the symptoms is not determined. The identity of the parasite has not been established:—(*Tropical Veterinary Bulletin*).

A CRYPTORCHID OPERATION.

Kircher, of Egling, records the following case. The subject was a four-year-old stallion, a double cryptorchid; and the owner's account was that an unsuccessful attempt at castration had been made six months before. External examination revealed nothing but *one* scar arising from the previous operation. Rectal investigation revealed a testicle about the size of a hen's egg on the left side in the abdominal cavity. The place of the left internal inguinal ring seemed occupied by a cicatrix as thick as the little finger. The right internal inguinal was passable for the little finger, and the author thought he could feel the spermatic cord in this opening. In front of the rim of the pelvis on the right side a soft body resembling a testicle could be felt. This rectal examina-

tion was very difficult, on account of the resistance of the animal.

The horse was thrown, narcotised, placed on his back, and prepared for operation. The left testicle was reached with the right hand and removed fairly quickly. The right testicle was then sought for with the left hand. It was in this region that castration had been previously attempted; and, in the direction of the external inguinal ring, the author encountered some difficulty from the presence of a cicatricial band, which might have been mistaken for the stump of the spermatic cord. Finally he succeeded in passing this obstruction, and penetrating the external inguinal ring into the inguinal canal, where he found a body which was as large as the testicle of a four-weeks-old pig and was hanging to a fairly long peritoneal attachment. At first he took this body for a small testicle retained within the inguinal canal, and removed it with the emasculator. He noticed, however, that no epididymis was attached to it; and, remembering the results of his rectal exploration, decided to search further. Passing his hand through the inguinal ring into the abdomen, he succeeded in finding the soft body previously mentioned in front of the right edge of the pelvis, which really was the testicle. The body he had found in the inguinal canal was the epididymis, and the structure he had previously felt per rectum in the internal inguinal ring and taken for the spermatic cord was in reality only the peritoneal attachment of the epididymis. He now drew this attachment, and the testicle along with it, far enough outwards to be removed with the emasculator. The wound was then sutured, and the animal was left without any after-treatment. The author did not see him again; but the owner afterwards reported that recovery had taken place without any swelling in fourteen days.

The author adds that, in cases of double cryptorchidism, he always removes both testicles at the one operation, and has never observed any bad results. But when one testicle is situated normally and the other abdominally, he now performs two operations, removing one testicle at each. As a rule the normal testicle is fairly large in such cases and has a strong spermatic cord; and the author, in operating upon adult horses in one operation, has been much troubled with after-bleeding, which in one case was fatal. Since adopting the plan of two operations, he has had no bad results.—(*Münch. Tier. Woch.*)

[This case illustrates the necessity of rectal examination before the cryptorchid operation. —*Transl.*]

Hyper-sensitivism to Cocaine in a Horse.

G. Mercier (*Journal de Méd. Vét. et de Zoot. de Lyon*) reports the following observation, which shows that accidents may occur in horses from an individual hyper-sensitiveness to cocaine.

A fifteen-years-old horse (a "cheval de luxe") was lame on the right fore limb, and cocaine was injected for diagnostic purposes. Four cubic centimetres of a 2½ per cent. adrenalin-cocaine solution was injected into each side of the pastern, upon the course of the nerves. Five minutes after the injection the horse showed restlessness, and struck the ground violently with his fore feet. This was at first thought to be the normal stimulation produced by cocaine, but soon proved to be something very different. The horse, on being walked, commenced to plunge about and to rear; and, after travelling ten or twelve yards, he refused to go further. At this moment the face became contracted, the nostrils were greatly dilated, the respirations were accelerated, the pulse became rapid, and an abundant sweat covered the whole body. The animal seemed tetanised; the neck was stiff, the head high, and the limbs could not be flexed. If the horse was forced to move forwards, he did so with very great difficulty. Finally, ten minutes after the injection, the animal fell violently to the ground as if seized by vertigo.

On the ground the symptoms became exaggerated. The pulse became enfeebled, the respirations were more and more accelerated, the mouth was kept widely opened, and the sweating was still abundant. The condition seemed hopeless, and the animal was expected to die at any moment. He remained in this state for an hour and a half, during which time the least sound produced a violent crisis of the attack. The symptoms then abated, the crises became more intermittent, and gradually a great calm succeeded the violent excitation. Three hours and a half after the injection, the horse was got up and placed in a box. Two hours later, he had regained his normal condition.

This case of rapid intoxication by cocaine is interesting, partly because of the small dose of cocaine which provoked it, and partly because the presence in the solution of adrenalin, the action of which is to retard absorption and consequently diminish toxic effects, did not prevent the intoxication.—(*Annales de Méd. Vét.*)

W. R. C.

FILTERABLE VIRUSES.*

Report by Professor K. F. Meyer, Department of Pathology and Bacteriology, University of California.

[Abstract].

Concluded from page 159.

The number of successful attempts in cultivating the filterable viruses is very small, but the last years have shown that they can be achieved by using certain special precautions and, particularly, especially devised culture media. Cultures would not help materially in the solving of the pending questions on the biology of the filterable viruses, but would be of tremendous economic importance in the preparation of immune sera. From the reports of successful cultivation we exclude all the saprophytic micro-organisms, and consider here the true parasitic viruses only.

The only filterable virus which has been readily cultivated is the virus of pleuro-pneumonia. The process of cultivation is, in our experience, so successful—as

* Presented at the Tenth International Veterinary Congress, London, 1914.

has been shown again, quite recently, by Poppe—that it can be used even for diagnostic purposes. . . .

A large number of filterable viruses remain active for a long period when kept outside the body, when protected from light and changes of temperature. Nocard found the virus of African horse-sickness virulent after two years and four months, when hermetically sealed in glass tubes. Haring had some virus of epithelioma contagiosum in a test tube at ordinary laboratory conditions, and found it of marked virulence after a lapse of four years. Similar observations on other viruses, suggested to v. Prowazek that some microscopically visible forms of the vaccinia virus are very resistant. Many viruses, like those of vaccinia, fowl pest, pernicious anæmia, even hog cholera, are resistant against desiccation, whereas, on the other hand, the causative agents in cattle plague, foot-and-mouth disease, etc., are destroyed in a very short time.

Similar differences are noted in the thermo-resistance of the various viruses. Temperatures above 60 degrees are fatal for most of the filterable viruses; temperature below 50 to 60 degrees C., attenuate certain viruses. Higher temperatures are more effective when the virus is tested in a medium free from all albuminous substances.

Kuhn found that the pleural exudate, containing the virus of African horse-sickness, when heated to 60° C., will become attenuated in degrees which depend on the length of exposure. The attenuation is indicated by a prolonged period of incubation.

Peter attenuated the virus of hog cholera by heat, and recommended such a virus for vaccination, but the experiments of Dorset and Uhlenhuth and his collaborators could not, on account of inconstant results, confirm his observations. Lower temperatures act generally as a preservative on filterable viruses. With the exception of the virus of sheep-pox and hog cholera, all filterable viruses are resistant, in varying degrees, to putrefaction.

The behaviour of filterable viruses towards chemicals has only revealed the fact that remarkable differences exist. However, no systematic study has been undertaken to demonstrate these differences, with the exception of glycerin and antiformin. All filter passers, as far as data are available, with the exception of the virus of sheep-pox and rinderpest, are uninjured by the action of glycerin. Uhlenhuth has demonstrated that antiformin does not affect the virus of hog cholera; his experiments were of great importance in eliminating, in a simple manner, the secondary invaders. Friedberger and Yamamoto found the vaccinia virus inactive when treated with 1 per cent. solution of antiformim. Thece few experiments do not permit of any conclusion. It is very important to have further and more systematic tests, with chemicals, carried out on various viruses.

Since v. Prowazek and Halberstadter have shown that protozoa are more easily destroyed by such cytolytic substances (5 per cent. solutions in one hour) as bile, bile salts and saponin, than bacteria (excerpt the pneumococcus), experiments have been carried out on a fairly large number of filterable viruses with the aim of throwing some light on their probable nature, whether bacterial or protozoan.

The reaction on protozoa by these cytolytic substances is a process of saponification of the lipoids of the periblast.

The experiments so far reported have not been conducted with sufficient uniformity to permit far-reaching conclusions for a classification of the viruses.

. . . Inasmuch as Uhlenhuth and his collaborators have tested, in one experiment only, the effect of a 10 per cent. solution of sodium taurocholate on the hog cholera virus and found it to be inactive, I have undertaken a large series of experiments on which I reported in 1912. These experiments demonstrated the fact that a 10 per cent. solution of sodium taurocholate did not destroy the hog cholera virus when it was exposed to the chemical for twenty-four hours, at 37° C., in two experiments. In two other tests, even a 5 per cent. solution was destructive, and rabbit bile attenuated the virus although it still immunized. Saponin in 10 per cent. and 5 per cent. solutions was uniformly detrimental to the virus, a 1 per cent. solution attenuated the virus in a similar manner, as above mentioned, for the rabbit bile. Lecithin in a 20 per cent. solution did not kill the hog cholera virus.

From the experiments it is apparent that the hog cholera virus does not belong in the group of protozoa, and the findings of spirochætes by King, Baeslock and Hoffmann, which they associate with hog cholera and even consider to be their causative agents, are not well supported by results with these cytolytic substances.

The extreme minuteness of the viruses accounts, perhaps, for their contagious nature and virulence. It explains also why most of the viruses are active in extremely high dilutions. Yet these facts are not absolutely constant, and we find differences even when the best possible position and the natural portals of entry are selected. The observations of Theiler during his studies on the immunity of African horse-sickness, that the virulence of a virus is quite different when it is obtained from various localities, we have also found in connection with some work on hog cholera. The hog cholera virus in the eastern states of America, frequently produces in highly susceptible pigs only a mild and chronic form of cholera, as compared with the viruses from Iowa or North Dakota, which invariably cause the acute septicæmic form of the disease. An immunity produced with an eastern strain will not protect against a western strain, but the reverse is easily achieved. Such experiments are very difficult to carry out, as the individual disposition is extremely variable even when the age and species of the animal are kept as constant as possible. Considering at the same time, the remarkable fact that most of the filterable viruses are only transmissible to animals of the same species, the exceptions being rabies and vaccinia, it is not surprising that the causes of these conditions have not been studied in detail. Another obstacle, which is found in these studies, is the observation that many filterable viruses are changed by mutation to such an extent that they show entirely different biological properties. The virus of foot-and-mouth disease loses its pathogenic effect for bovines through little pigs of a special race (Loeffler); the fowl pest virus looses its virulence when transmitted to pigeons. These few facts should be carefully considered when working with filterable viruses and proper statements as to the origin of the virus should be made; the experiments being carried out only with a constant and unmutated virus.

Inasmuch as most filterable viruses, on account of their minuteness, obey the physico-chemical laws which govern the diffusion of gases and substances in solution in liquids, they are extremely contagious or, possibly, "air-borne." The contagiousness depends, however, largely on two conditions: the source and the portal of entry or the infection.

When a virus is eliminated by the excretions, the respiratory air, the skin, etc., and can exist outside of the host under favourable conditions, and can enter into the body through the injured skin and mucous membrane of the intestinal or respiratory tract, it is (by experience) extremely contagious. For some viruses, an inoculation into the skin by bites of an infected animal or by intermediate insect carriers are absolutely necessary; under these conditions the direct contagiousness has not been observed. The transmission of filterable viruses of animals by insects has been con-

clusively proven only for the heart-water diseases of sheep in South Africa, epithelioma contagiosum of chickens and horse-sickness virus by stomoxys in the experiments of Schuberg and Kuhn.

Bacteria play a very important secondary part in many diseases caused by filterable viruses; in some diseases indeed, the investigations thus far carried out do not permit a final conclusion as to the actual importance of these invaders. Quite recently two different kinds of bacteria have been isolated in distemper of dogs, and the accepted conclusions, based on the findings of Carré, that this disease of dogs is caused by filterable viruses, has been severely shaken. Galli-Valerio and Kregenow have already reported that the filtrate of the secretions in distemper is not infectious, and the results of Ferry, Torrey and others are, therefore, not surprising. Whether the real distemper of dogs is actually caused by a *B. paratyphosus* B, as v. Wunschheim claims, has still to be proven. In a recent publication, Th. Smith calls attention to the frequent occurrence of a bacillus identical with that isolated by Torrey in pneumonia of guinea-pigs, and it is apparent that a possible relationship between the two organisms exists.

The question of the importance of the bacillus of fowl diphtheria has already been mentioned above, and it is only another instance where further careful experimental work is badly needed. . . . . The work of Pfeiler and Kohlstook has shown how important a hog cholera-like organism can be in connection with diseases in pigs. The very careful experiments of these investigators have clearly proven that actually two forms of hog cholera exist in Germany and Hungary, one being caused by the known filterable viruses, the other due to a bacillus related to the hog cholera group, the bacillus of Voldagsen. As the disease in young pigs has great similarity with the one caused by the filterable viruses, it was not properly recognised by many investigators, and was classed, without further investigations, with hog cholera. Even if the association of the *B. suipestifer* with the disease, is very close, the interpretation of its importance by Uhlenhuth and his associates, following the findings of Dorset and McBryde, De Schweinitz, Theiler, Hottinger, Smith and others, is too eratic, and it is surprising that similar mistakes are not more often made. In my opinion, the secondary invaders, in many diseases due to filterable viruses, are as important as the virus itself, particularly in hog cholera. No careful pathologic-anatomical studies are available in which the statement is actually proven that the secondary invaders are primarily responsible for the post-mortem lesions. If we conclude by analogy, comparing African horse-sickness and rinderpest with hog cholera, the secondary invaders at least cause all the changes which are not purely confined to the capillary system. In the septicæmic form of hog cholera the general petechiation alone indicates the effect of the filterable virus.

In practically all filterable viruses, secondary invaders are common. In African horse-sickness, Theiler and the author frequently found a colon bacillus in the spleen. In cattle which succumbed to pleuro-pneumonia, various types of cocci have been isolated from the heart blood.

The streptococci and the staphylococci found in the contents of the blebs in foot-and-mouth disease also belong to the same group, and explain the findings of Niesser and others. Although Poels, Basset, Gaffky and Bemelmans have proven the filterable nature of the virus of equine distemper, and Gaffky and Luhrs have demonstrated by transmission experiments, the probable protozoan character of contagious pleuro-pneumonia of horses, the *B. bipolaris* and the *Streptococcus pyogenes equi* have secondary importance.

In many diseases the secondary invaders are so constant that they can be isolated in pure culture, and the recovered animals remain carriers for a long time, as has been shown by Petrie and O'Brien in connection with a guinea-pig septicæmia.

The importance of spirochætes in hog cholera, to which King and his associates have devoted several publications, has already been discussed.

Arnheim considers the spirochœtes found in hogs to be saprophytes of the intestinal tract. I cannot entirely support his views, inasmuch as I have seen these protozoa also acting as true tissue parasites in a submaxillary lymph-node following a severe croupous conjunctivitis with tremendous quantities of spirochætes. Even without hog cholera such spirochæte infections of the ectoderm have been seen.

In some instances the filterable viruses even cause the reappearance of latent protozoa ((*Piroplasma bigeminum* and *P. mutans*) in rinderpest or in heart-water.

The possible symbiotic relationship of the virus to pathogenic bacteria has not been studied in many animal diseases, v. Prowazek has shown that the "energetic symbiotic" condition not only increases the virulence of the organisms, but also the effect on the host. The study of this relationship is of considerable practical importance in the attempts to control one or more agents of the disease by immunisation.

The study of the anatomical changes caused by filterable viruses has not been appreciated sufficiently. The interest being more concentrated on the attempts to find the causative agent naturally leads to the search for cell inclusions and chlamydozoa. On account of the remarkable biological differences of the filterable viruses, the effect on the different parts of the body, the specific selection of certain tissues, a condition called by Lipschutz "tropismus," no uniform anatomical picture for comparison or classification can be expected. Yet the study of the morbid anatomy of pleuro-pneumonia of cattle by the author, which has recently been confirmed by Boynton, shows in an interesting manner how specifically the virus affects the lymphatic system of the tissues with which it is brought in contact. The careful historical study of da Rocha-Lima in connection with yellow fever revealed facts which can undoubtedly be used for diagnostic purposes.

Inasmuch as the macroscopic lesions for some of the animal diseases like hog cholera, horse-sickness, etc., show similarities to those found in the large group of hæmorrhagic septicæmias, it would appear to be of interest to find out whether or not there exist more specific differences. Glässer, Dammann and Stedefer describe, in hog cholera, capillary, endothelial lesions combined with focal, small-cell infiltration and necrosis. In horse-sickness the stasis in the portal system, combined with marked capillary and cellular degeneration of the liver and kidneys, was predominant in the few cases studied by the author.

These few examples gave me the impression that probably valuable information could be obtained as to the mode of the pathogenic action of the filterable viruses by means of careful histo-pathological studies. Furthermore, proper attention should be paid to the primary and to the secondary lesions and their respective anatomical relation.

The problem of immunity in filterable viruses is interesting, not only from a historic point of view, since small-pox and the anti-rabic vaccination are the most successful methods of immunization we know, but also on account of its great practical value in the eradication of destructive epidemics. The results which have been obtained in the various diseases are very encouraging,

but one is unable to mention in a review *all* the facts which have been collected.

The existence of a natural resistance in filterable viruses as an absolute immunity against the diseases of one species of animal has been known for a long time (horses against contagious pleuro-pneumonia of cattle, cattle against hog cholera). An individual or racial immunity is frequently met with in experimental work with filterable viruses, particularly in hog cholera; also, according to Lowenthal, in pigeon epithelioma. In reality this immunity is probably an acquired one, as has been proven, particularly for sheep-pox (Nocard), hog cholera and rinderpest (Soberheim).

With the exception of fowl pest most of the filterable viruses have a sub-acute course, and therefore confer in many instances an acquired immunity. A complete immunity of permanent duration is only observed after a very severe attack or after repeated reinfection. The latter course particularly is very important in the establishment of a lasting immunity.

There are virulicidal substances produced which can be tested *in vitro*, and also particularly demonstrated in animal experiments, but in many instances these bodies do not seem to be of vital importance for the immunity. The appearance of the virulicidal substances is not regular; they may be absent at a time when an immunity is already established, or the antibodies disappear from the blood when the immunity is of continuous duration. Many attempts have been made to apply the normal bacteriological immunity tests to filterable viruses, but contradictory results only have been obtained. The author had, in connection with the study of several diseases, an opportunity to review the various statements in the literature. In vaccinia all experiments have shown that the alexin fixation or precipitation tests do not give reliable results. The work of Heller and Tomarkins, Xylander, Bermbach and others for the alexin fixation on one side, and the result reported by v. Prowazek and v. Pirquet for the precipitin test on the other hand, can be confirmed. In this dermotropic disease not a serum immunity, but a cellular or "histogenous" (v. Prowazek) immunity, is important. . . . In sheep-pox a serum immunity is probably present, but the conditions establishing a resistance against subsequent infection has only been superficially studied from a serological point of view.

In the serum of rabid or actively immunized animals no complement-fixing bodies have been found by Heller and Tomarkins, Friedberger, Moser and Baroni, Cinca, the author and others when using nervous tissues, whereas Nedrigailoff and Sawtschenko and Zeller report positive results when using the extracts of the salivary glands as antigens.

These discrepancies, due to the preparation of the antigen, explain perhaps the failures which are reported with other filterable viruses. It is only by systematically testing the various tissues or fluids which develop antigenic properties in the animal that one can deny absolutely the non-existence of immune bodies which can be demonstrated by serological methods.

In some unpublished experiments the author found the complement fixation tests very unreliable for the demonstration of an existing immunity in contagious pleuro-pneumonia of cattle. Only in one naturally infected animal could immune bodies be detected. Poppe has studied this question very carefully and obtained fairly constant results with the alexin fixation test, contrary to the result of Schochowsky; the precipitate reaction of Fornet was even more reliable.

Some means to standardize the value of the protective sera against hog cholera, horse-sickness, etc., or to differentiate by quick and less expensive methods, clinically or by post-mortem examination, extremely similar diseases (hog cholera an swine plague) or to detect dangerous carriers (pernicious anæmia), are certainly needed, and it is not therefore astonishing that serological methods have also been applied and tested in these directions.

Lichtenheld thought he had demonstrated antibodies in horse-sickness; in a series of tests made by the author no complement-fixing antibodies could be detected. In hog cholera, with numerous antigens prepared by a multitude of methods, no uniform results were reported by Uhlenhuth and his collaborators, Hutyra, Buchanan and the writer. In foot-and-mouth disease and swamp fever neither the complement fixation nor the precipitin reaction proved useful.

. . . The few scattered, careful serologic tests permit the supposition that an entirely different group of virulicidal bodies is responsible for the protective properties of an immune serum. This ignorance as to the nature of the immunity is clearly felt in all attempts at immunisation against filterable viruses, even when they are the most successful we possess. Even in the immunisation against rabies the actual properties of the antirabic serum are unknown. The observations of Marie, Kraus, Remlinger and others indicate that the serum contains specific rabicidal substances, and not, as Fermi explained, purely neurotoxic properties. Yet the fact that chicken serum loses its normal antirabic effect when the bird is immunised with fixed virus has still to be explained. Undoubtedly one is not justified in attempting to explain the immunity phenomena in filterable viruses by deductions from the mechanism of immunisation in bacterial diseases; fundamental differences exist here, particularly with regard to the antigenic properties of filterable viruses.

Most of the filterable viruses causing septicæmic diseases—with the exception of swamp fever and fowl pest—possess antigenic properties, the serum of the immunized animal having protective properties which can, of course, be demonstrated only by tests *in vitro* or *in vivo*, the latter method being the only reliable one. If in bacterial disease the antigen is, on account of its unknown nature, characterised in a negative manner, the same can be said to be even more true for the filterable viruses. With one or two exceptions it is entirely impossible to prove an antigen-antibody reaction by our present method, and only the facts which have been gathered by numerous experiments that the serum of an immune animal treated with the virus contains antivirulent substances justify the conclusions that the virus acts as an antigen. The immunization in rinderpest, hog cholera, African horse-sickness, sheep-pox, &c., are examples to illustrate this statement, but when we consider the conditions found for the antirabic serum, vaccinia, contagious epithelioma in chickens, the nature of the immune bodies produced by antigens is an entirely different one. Such conditions are certainly to be expected on account of the marked biological differences of the viruses.

Aside from these facts, the possible mutation and mitigation of the virus by animal passage is important, the antigenic properties becoming either constant or entirely lost (lyssa, fowl plague, foot-and-mouth disease, epithelioma, &c.).

The antigenic properties can also be judged only from the immunity which is conferred by the injection or application of the unattenuated or attenuated virus or by the protective or curative properties of the sera of an animal which has survived a natural infection or has been artificially immunized and hyperimmunized. Whether, in the latter instance, the specific action of the serum is an anti-parasitic or antitoxic one has not as yet been decided for most of the filterable viruses.

The immunization experiments have shown that the filterable viruses act best as antigens when they are used in an unattenuated form of high virulence, best unfiltered, and in comparatively large doses for the pro-

duction of protecting sera. For active immunization the virus is attenuated by heat (sheep-pox, Duclaux), (horse-sickness, Kuhn), or desiccation (rabies), or by chemical substances like glycerine (rabies). In some instances also a specially selected avirulent strain can satisfactorily be used for immunization (blue tongue of sheep). The mode and seat of infection is also important, particularly in pleuropneumonia; the injection of a culture at the root of the tail produces only slight reactions, but a lasting immunity, whereas the application of the same culture in any other part of the body is fatal in most cases. But, as shown by some observations of the author, the virulence of the strain to be used must be previously tested, otherwise even the inoculation at the tail can be harmful.

The few facts cited in this report have only been given with the intention of showing that an immunity is obtained by using the antigenic properties of the filterable viruses, and that we are justified in applying the methods for protective immunization of animals, particularly in epidemic diseases.

Inasmuch as a passive immunization is successful in many bacterial diseases, this method was also used in the prophylaxis against rinderpest, hog cholera, foot and-mouth disease, and horse-sickness; but recent investigations have clearly shown that the artificial condition produced is only of such a nature as to lessen the severity of a subsequent attack, but not to prevent the invasion of the virus (rinderpest, Ward and Wood), (hog cholera, Dorset, Uhlenhuth and others). The value of the simple, passive immunization has therefore lost considerably.

. . . For most of the specific dermato, or neurotropic diseases due to filterable viruses, only the active immunization by specially mutated or otherwise attenuated viruses has proved to be really reliable and successful.

The immunization of dogs against rabies, after the method of Miessner and Pfeiler, being confirmed by Pokschischewsky, opens a broad field for practical application: we have not as yet lost hope, however, that perhaps the use of a sensitized vaccine is less dangerous than the intraperitoneal inoculation of large doses of fixed virus.

An active immunity frequently confers immunity to the offspring. An inherited immunity is particularly of practical importance in hog cholera (Reynolds) and sheep-pox (Borrel).

Animal and Agricultural Motor Traction. A Comparison.

Translated from the *Mitterlungen der Deutschen Landwirtschafts-Gesellschaft*, by Mr. H. W. ANDREW, Librarian, Department of Agriculture, S. Australia.)

The great number of mechanically driven apparatuses of the most varied description offered to agriculture for testing and use in the tillage of the soil has led to a comparison between the work performed by animals and that by manufactured motors. A representation of the elementary principles which underlie the question will be attempted in the following article, and after the manner set forth in a work by Max Ringelmann entitled "Les Animaux d'attelage et les tracteurs" in the *Journal d'Agriculture Pratique*," 1913, Part 1.

Ringelmann terms draught animals "animate motors," in contradistinction to the "inanimate motors," or mechanical tractors. The requisite fuel (feeding stuffs) for the animate motors is relatively easy to procure, while nature herself looks after their further internal organisation. Very little attention to their external parts is required. It is different, however, with inanimate motors. Here, to secure effective maintenance of all their functions an unceasing watch must be kept over their respective parts unless the motors are to be relegated to the scrap heap, or prove profitless However, an essential advantage of these machines is that given a continuous supply of fuel they need no rest, and furnish uninterruptedly the desired energy. On the other hand the draught animals have the advantage that they can be adapted, according to their number, to immediate needs. If the plough does not make good progress with two horses then it will improve with four or more. The power of the motor on the contrary cannot be so distributed, it must be carefully selected for the particular work which it is to generally perform. If for example, it is constructed for traction purposes requiring 10 horsepower then its use in work needing less power will not be economical and to a material extent too costly. It is also inferior to the animate motor in so far as it cannot perform work which exceeds the normal energy without suffering injury, which, as is well known, can be done under circumstances—at least for a time—in the case of a draught animal.

The pulling power exercised by an animal in its ordinary locomotion on an ordinary surface and on the same incline is a function of a part of its live weight. At rest, the pressure of the total live weight is distributed on the two parallel parts—that carrying the fore feet, and that of the hind feet.

Whenever the animal progresses, the forequarters determine the direction of movement, whilst the hindquarters essentially serve as motor. Only on "difficult" occasions does the animal pull with four "shoes" and usually the pressure of the hindquarter relieves the draught. The draught ought always to stand at a certain inclined angle to the surface—rising from the level of the hocks to the point of draught on the collar. This incline gives rise to an increase of the pressure on the forefeet.

The change in the sum of the pressure of the hind feet corresponds with the difference of the pull and may be reproduced by means of a dynamometer when the animal is harnessed to a machine (*e.g.*, a reaper), furnished with an apparatus for equalising the draught —fly wheel or spring. When a tilling implement is harnessed to the draught animal without a fly wheel or spring, as is usually the case in using the plough, scarifier or harrow, certain muscles of the hindquarter are called upon to bear an extra strain in order to perform the work in the same unit of time. The animal gets very tired, and as it cannot modify the pressure it endeavours to obtain a firmer hold of the ground by altering the inclination of the hoof. The impression of the hoof on ploughed ground well illustrates this fact. The toe is more clearly imprinted than its sides. This explains therefore why our draught animals, notwithstanding the same amount of mechanical work is done, tire more than they do with implements which are furnished with adjustments for equalising power (springs or fly wheels) particularly when the animals work on soft soil. Supposing the vertical line representing the gravity centre of the whole body does not change its position to the spinal column of the quadruped (and this only really occurs occasionally) it can be further assumed that the mean of the gravity forces of the hindquarters in a stride may be the same as when the animal is at rest. When the pulling power demanded of the animal is increased the animal decreases the amplitude of its stride. In the case of an inanimate motor the wheels exert a pressure upon the ground analogous to that of the animate motor, but the tyre action of the wheel is confined to a limited space, as would happen were the strides of a draught animal very short. The questions, however, as to the slipping of hoofs or wheels on the ground and their sinking in a more or less loose soil are the same, so that what has been said of draught animals partly applies to inanimate motors.

If the draught animal or the motor has to negotiate a rising incline then the active perpendicular pressure upon the ground is lessened. When the incline has a certain gradient the pressure is of such little value that animal or motor slides. The decreasing value of weight-pressure on the hind limbs in climbing is accompanied by a decrease in the draught power, whilst the obstacle to be negotiated becomes a greater quantity. The same thing applies to an animal or motor on a loose soil. Likewise in working on a down slope the pressure of the fore and hindquarters is decreased, and when the fall becomes very great the animal again slides, but its weight adds to the working capacity; the latter also applies to the motor. At the same time the descent tires the animal considerably in so far as it must bring into play to excess certain muscles of the forequarters, difficulties which disappear where motors are concerned.

If the ground on which the draught animal proceeds is firm, as, for example, a paved or macadamised road, the pulling power which it can exert depends upon the pressure of the hindquarter on the ground, and upon the friction. The mean pressure of the hindquarter has been stated to amount to 42—43 per cent. of the total weight of the animal. The co-efficient of the friction of the shoe on the ground varies from 0·3—0·7 according to the condition of the ground. On a dry macadamised road the co-efficient is 0·5—0·6 on wood—against the grain—only about 0·06. If a paved road is wet or frozen over, the friction co-efficient is lessened considerably, and in the former case is comparable to that of polished iron or glass, *e.g.*, about 0·15. The draught animal can then only exert a very limited draught—it slips and falls easily when its shoes are not grooved or provided with spikes. It is quite different with motors. On a firm level road the maximum towing power is given through the pressure exerted by the motor wheels multiplied by the friction co-efficient of tyre width upon the ground.

If the ground covered by the draught animal is soft the hoof sinks in and grips hold of the ground, so that the possible pulling power no longer depends exclusively upon the friction co-efficient. On ploughed ground one can see plainly that the toe of the shoe sinks deeper than its sides, and if the ground be very soft the impression of the whole hoof and the frog is very apparent. The oblique direction of the supporting surface is eminently useful in the progress of the animal; the ground under pressure becomes closely packed, and gives the hoof a kind of fulcrum. The reverse happens in the case of a motor wheel which moves on a soft soil; it sinks and has contact with the ground on an increased pector of its periphery, which is equivalent to an incline, and this is decidedly unfavourable. It provides no hold for the wheel—thus it is exactly the reverse to the efforts of a draught animal. To lessen this difficulty motor wheels are furnished with grooves of different kinds, but as the speed of the wheel circumference is always greater than the speed of the motor itself these grooves or projections displace the ground. Under certain conditions Ringelmann was able to demonstrate "slips" from 3 to 4 cm. and where the surface of the ground was a little wetter a "slip" of the wheel in the circumference of nearly 0·15m. Under unfavourable conditions these projection are quite dangerous, for they so break up the ground that the soil gathers up in front of the wheel. The ground is not only compressed through the forward pressure, but also rendered slippery on account of the slipping, and with certain kinds of soil, one sees according to its special character (moisture content, texture, etc.) large clods or cakes, compressed and smooth, coming away from the ground like mud bricks. This calls for a certain expenditure of energy on the part of the motor which is of no use in actual towing work. It should also be pointed out that owing to the unevenness of the surface the compression of the soil by the wheels is not equally distributed over the whole width of tyre, in consequence of which the clods are narrower than the tyre which plainly limits the unnecessary expenditure of energy. The compression of the soil by the motor does not extend very deep. It is more intensive in the upper layer than below.

The plough drawn by the motor will not evenly work these variously compressed patches of soil without special treatment. It is therefore advisable to attach parts of a harrow or of a cultivator between the motor and plough. The wheel friction co-efficients increase with the depth to which the wheel sinks into the ground. Ringelmann has compiled the following in regard to lighter motors :—

Macadamised street	0·016 to	0·02
Firm turf	0·02	0·03
Old Lucerne		0·06
Dry, sandy soil	0·07	0·08
,, field		0·08
Stubble, cut with cereal mower		0·09
Native pasture, cut with grass mower		0·10
Native pasture, dry	0·13	0·14
Fallow		0·15
Newly ploughed land	0·20	0·30

Apart from the effective work of motors moving independently along a firm (macadamised) road we learn from this compilation that a pulling energy is lost according to the condition of the ground varying from 1 : 15. On a firm turf the motor exerts the greatest effect, but the tilling implement (plough or scarifier) which it tows demands on its part the greatest draught-energy. On a freshly ploughed field the towing power sinks to a minimum but the implement requires less energy. Thus there exists no complete agreement between the two extremes. The practical effective amount of work performed by a motor is never constant. One often sees that a motor even if with a little difficulty can tackle field work where the plough fails, and on the other hand one can notice that the motor fails where the plough is capable of working.

"Fair Comment."

The following extract is a portion of the judge's summing up in the case of Stevens v. The Brit. Med. Assn., which was very fully reported in the *Brit. Med. Jrnl.* of Aug. 1. Although the case does not relate to veterinary medicine there is a certain common interest involved.

Mr. Justice Shearman: Gentlemen of the Jury,—This, as you know, is an action for libel brought by Mr. Stevens against the British Medical Association, and it is an action brought upon one of a series of articles which appeared in a newspaper called the *British Medical Journal*, which articles were substantially reprinted in a book. The plaintiff comes here and asks for damages because he says his reputation has been wrongly assailed.

Gentlemen, there are two questions I have to leave to you, and one will take a very short time to explain. It has been well settled law in this country for a great many years that it is not for the judge, but for the jury, to say whether the words complained of are libellous or not. A libel means something which conveys an imputation upon the character of the person who brings the action. I cannot say, but it is for you to say, whether there is something in this book which is libellous; and that question will not take you very long to decide. The plaintiff comes and says, "They call me an impostor"; and Mr. Colam says, "We are justified in our comment by saying 'He cannot prove what he states.'" So that you may very well come to the conclusion that apart from the defence of fair comment

there are matters derogatory to the plaintiff's reputation in these words, but it is a matter I have to leave to you. If you came to the conclusion that they were not attacking the plaintiff's character, but only his medicine, there would not be such an action. If you came to the conclusion that the words attack his character as well as his goods (he has not brought an action for an attack upon his goods, but upon his character) then you will answer: Yes, these words are libellous; in other words, that they convey an imputation upon the plaintiff.

Then, gentlemen, the real matter begins, because the defendants say, "If we have made an imputation we are justified in doing it by what is called the law of fair comment." Now, gentlemen, that leaves this serious question for you to decide. Before I deal with the evidence I want to instruct you in what I conceive to be the law. It is a very important principle in this country that a man's character shall not be improperly attacked. A man's good character is his property, and no one has any right to attack his character. That is one excellent principle; but, gentlemen, there is another very excellent principle too, and it is that this is a country where, when matters of public interest arise, everybody shall be at liberty freely to express his own mind in honest criticism. That, gentlemen, has been called in other terms the right of free speech. It is not confined to newspapers, but it is open to you, or to me, or to any of us. It does not apply when we are dealing with purely private matters, but when we are dealing with matters of public interest that right of free speech or comment applies. That is another important principle. It is important that a man's character should not be wrongly attacked. It is important that a man should have a free right to criticise matters of public interest, and it is when those two principles come into conflict that the difficulty arises.

The law, I understand, is this: It is for the judge to say whether this is a matter of public interest. I decide that it is a matter of public interest. I do not think any one can question it, because any question involving the treatment and cure of tuberculosis and the medical interest of large bodies of persons is a matter which can be freely discussed. Therefore that point does not arise.

That being so, it is not for me, but it is for you, to decide whether it is fair comment, and if I may respectfully say so, that is a sensible principle of law It is not for one person who sits as a judge to decide, but it is for twelve people selected from amongst the citizens of the city where the case is tried, and they have to say where the line is to be drawn between the two principles of attacking the character and the right of having free speech on matters of public interest. For a great number of years it has been left to the gentlemen of the jury to say, having regard to all the facts of the particular case, have the defendants gone beyond the line of fair criticism, or are they within the line? That is the question which you have to decide. Bearing in mind that one jury, as we know (we know very little about the previous case), have disagreed about it, I hope you will carefully apply your minds and, if possible, come to an agreement upon this matter.

Gentlemen, there is one other thing I ought to have called your attention to with regard to deciding what is fair comment. Some people think it is not fair comment, and cannot be fair comment, to attack a person's character. That question has been decided in the courts too, and it has been decided in a court to which we all have to pay respect. What are the principles which a jury ought to apply? I am going to read what one of the judges of the Court of Appeal on this matter said. He said: "The defence of fair comment assumes that the matter to which it relates would be defamatory if it were not protected by the defence of fair comment." Then he says: "A fair and bona fide comment on a matter of public interest suffices to protect that which would otherwise be defamatory. Comment which tends prejudice may still be fair: it may convey imputations of bad motive so far as the facts truly stated justify such an imputation." In other words, if the facts which people prove in court justify the imputation that they have made, it may be fair comment. "It is for the jury to say whether the facts justify the imputation or not. The fault here is that that question has never properly been left to them. The question for the jury is whether the comment, in their opinion, is beyond that which a fair man, however extreme might be his views in the matter, might make honestly and without malice, and which was not without foundation." Gentlemen, to put it in a shorter sentence, it means this: You first have to decide when you look at these words what imputation is made. It is for you, and not for me, to decide what is the exact imputation. Then you have to decide how much the defendants have proved, and, bearing in mind what they prove, do you think, on the facts which you believe to be proved, that the defendants have done anything more than fairly comment upon a matter of public interest? You will say if you think they have done more and gone out of their way to make an attack which was not justified by the facts. You may find it is not fair comment on the facts proved before you, and which have been proved in the course of the case—not merely the facts which were before the man who wrote the article, but upon all the facts which have been proved before you by the witnesses while you have been sitting in the jury box; if you come to the conclusion that certain facts are proved which would warrant the imputation made in that article, then you can find for the defendants. It is for you to say aye or no; looking at the facts, do you think this is fair comment, realising that comment cannot be fair if the imputation or comments rest upon untrue facts? But if they rest upon true facts and they do not go beyond fair comment you can find for the defendants. I think that will explain to you what the law is upon the matter.

It is not for me to tell you exactly what imputation is conveyed in the words I am going to read. A case very much like this was tried not very long ago, when the judge instructed the jury as to what is the meaning of the word "quack," which I believe is one of the words used here. The higher Court said that it is for the jury to decide what it means, or rather what it means when it is used in a particular sentence. I cannot therefore tell you what this means. You have to make up your minds, and having done that, you have to look at all the facts and say whether the defendants have or have not gone beyond the limits of fair criticism—that is to say, honestly commenting upon the true facts. There is one other matter about the law and then I will pass away from it. I do not want you to form any opinion, that because I have had to pull up the plaintiff frequently for doing things which he ought not to have done, that shows I have prejudice against him. It is my business to see that the only evidence put before you is what is actually evidence. One cannot have in these courts people coming forward and saying, "Oh! somebody told me so-and-so, and so I repeated it." There would be no limit or end to such evidence. Someone might come forward and say, "I saw Smith in the morning and he told me he had seen three ghosts. I saw Jones in the afternoon and he told me he had seen six ghosts." You might consider that that was evidence that there were nine ghosts walking about the place. The answer is that the first man may be a liar, or the other man may have told him lies. We cannot have what other people say because we only listen to witnesses who go into the

box, who can be seen, so as to judge after cross-examination whether you believe their evidence to be true or not. That is why from time to time I had to have little arguments with the plaintiff about the matter, but I was simply doing my duty in getting the evidence confined within the proper legal limits.

Let me in leaving this case and these documents to you finally sum this up. Although one has been discussing the history of consumption and the present knowledge of it, and although one has been discussing the effect of this particular drug, yet you have to confine yourselves very closely to what the real issue in this case is, and I come back to where I started. Having regard to all the evidence that has been given, all that is proved with regard to the value of this medicine, the effect it has had on patients, what doctors have said for and against it, to the entire conduct of the plaintiff since he took this medicine up to make a livelihood out of it, and having regard to what has been proved to your satisfaction in that matter, will you now turn to these articles here in this book, and say whether, having regard to what has been proved in this case, you think those articles are or are not a fair comment? That is the one and simple issue which you have to try which is of importance. Now which is it? If you come to the conclusion that the things that have been proved are not true facts so as to be a proper foundation for the comment and attack upon the plaintiff that has been made, then you will find for the plaintiff. If on the other hand, you find that the facts that have been proved in your judgment afford ground for the comments—that is to say, it is fair criticism and justified by the proved facts, then you will find a verdict for the defendants.

The Royal (Dick) Veterinary College Edinburgh.

The calendar for the session 1914-15 has now been issued. A silver medal is offered by Sir John Gilmour, Bart., of Montrave, for competition in each of the following subjects:—(1) anatomy; (2) pathology and bacteriology. Each medal will be competed for during season 1914-15 under conditions presently to be arranged.

The Board of Agriculture and Fisheries Veterinary Research Scholarships, of the value of £150 per annum, have been established in order to train promising students under suitable supervision with a view to their contributing to the development of veterinary science, either by becoming teachers or investigators. Scholarships will be awarded only to students who show distinct promise of capacity for advanced study and research in some branch of veterinary science. The scholarships will be tenable for three years, provided that satisfactory reports are made at the end of each year as to the conduct and capacity of the holder by the authority under whose supervision the scholar is placed by the Board. The scholarships will be open to students who have secured the diploma of the Royal College of Veterinary Surgeons. Three scholarships of the annual value of £100, tenable for three years, will also be awarded to honours graduates in science of any British University for the purpose of enabling them to study at an approved veterinary college with a view to qualifying as veterinary surgeons. Nomination forms may be obtained on application to the Board of Agriculture and Fisheries, Whitehall Place, London, S.W.

DISEASES OF ANIMALS ACTS 1894 TO 1911, SUMMARY OF RETURNS.

Period.	Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks (a)	Animals.	Outbreaks (a	Animals.	Outbreaks (b)	Animals.	Outbreaks (b)	Animals.	(b)	Outbreaks (a)	Slaughtered. *
GT. BRITAIN. Week ended Sep. 5	7	10	6	9	2	4	1	1	2	61	329
Corresponding week in 1913 ...	6	6			2	3	28	40	3	44	454
Corresponding week in 1912 ...	10	11	5	59	3	4	17	27	1	29	339
Corresponding week in 1911 ...	15	18			6	14				35	325
Total for 36 weeks, 1914	525	574	20	97	76	183	1539	2674	155	2882	29268
Corresponding period in 1913 ...	387	426			117	294	1940	3895	132	1760	23566
Corresponding period in 1912 ...	576	654	75	501	126	236	2365	5121	174	2247	29240
Corresponding period in 1911 ...	599	749	8	425	138	326			307	1803	21123

(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked: London 4.
Board of Agriculture and Fisheries, Sept. 8, 1914

IRELAND. Week ended Sep. 5	...	...	...	...	...	...	Outbreaks 2	2	1	6
Corresponding Week in 1913 ...	...	...	...	...	...	...	2	2	1	14
Corresponding Week in 1912 ...	...	...	2	11	...	...	1	1	2	11
Corresponding Week in 1911 ...	...	2	...	...	...	...	...	1	...	8
Total for 36 weeks, 1914 ...	1	1	76	955	...	...	64	392	159	820
Corresponding period in 1913 ...	...	...	...	...	...	...	101	376	113	589
Corresponding period in 1912 ...	3	3	26	247	...	...	52	263	179	1498
Corresponding period in 1911 ...	7	14	...	...	2	3	50	254	92	1587

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Sep. 7, 1914
NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

DISEASES OF ANIMALS ACTS, 1894 TO 1911.

Return showing the number of Premises on which the existence of TUBERCULOSIS has been notified to the Board of Agriculture and Fisheries during the month of August, 1914.

ENGLAND (Counties)	*		ENGLAND (*continued*)	*	
Bedford	1	1	Wilts	8	9
Berks	2	2	Worcester	3	3
Isle of Ely	1	1	York, East R.	9	13
Chester	11	11	York, North R.	1	1
Cornwall	1	1	„ West R.	12	12
Cumberland	2	2	WALES.		
Derby	3	3			
Devon	1	1	Anglesey	3	3
Dorset	2	2	Carnarvon	1	1
Durham	1	1	Denbigh	1	1
Essex	5	5	Flint	1	2
Gloucester	2	2	SCOTLAND.		
Hants	2	2			
Hertford	1	1	Aberdeen	8	8
Huntingdon	1	1	Ayr	4	4
Kent	4	4	Banff	1	1
Lancaster	14	14	Bute	1	1
Lincoln :			Dumfries	5	5
Parts of Kesteven	1	1	Fife	3	3
„ Lindsey	2	2	Forfar	7	7
Middlesex	1	2	Haddington	2	2
Northampton	1	1	Kirkcudbright	4	4
Northumberland	1	1	Lanark	2	2
Notts	2	2	Linlithgow	1	1
Salop	4	6	City of Edinburgh	1	1
Somerset	1	1	Perth	3	4
Stafford	4	4	Renfrew	3	3
Surrey	1	1	Wigtown	5	7
Sussex, East	4	5			
Warwick	1	1	TOTALS	166	179

* Number of bovine animals suffering from tuberculosis of the udder, tuberculous emaciation, chronic cough and showing definite clinical signs of Tuberculosis, or giving tuberculous milk, in respect of which notice of intended slaughter has been received.

PARLIAMENTARY.

FOOT-AND-MOUTH DISEASE.

In the House of Commons on Wednesday, September 9th : In answer to Mr. C. Bathurst (Wilton, Opp.),

Sir H. VERNEY (Bucks, N.) said : Since the original outbreak of foot-and-mouth disease at Stallingborough on August 28, ten further outbreaks have been confirmed, all within the district originally scheduled. One hundred and five cows, 118 other cattle, 196 sheep, 178 swine, and four goats have been or are being slaughtered as affected or as having been exposed to infection. The Board have consulted with the medical authorities at the War Office and are satisfied that the arrangements made for the detention of German prisoners will be such as to preclude any possibility of their contact with farm stock. Apparatus for disinfecting clothing will, however, be available if required.

Food for Live Stock.

The Board of Agriculture and Fisheries have given careful consideration to the question of the present and prospective supplies of feeding-stuffs for live stock. The large number of cattle in the country renders it necessary to conserve materials required for their maintenance throughout the winter, so as to avoid any excessive rise in the price of meat. The powers given to the Board by the Slaughter of Animals Act, 1914, will, if necessary, be used to prevent the wasteful depletion of the home meat supply, but it is important to ensure, as far as possible, that the cost of feeding-stuffs shall be kept at a reasonable level.

With this object the exportation of feeding stuffs for animals is generally prohibited, but the Board are prepared to consider applications for license to export small quantities of certain feeding-stuffs, so long only as the prices at which they can be obtained by farmers in this country are fair and moderate.

Differences between Pepsins from Different Sources.

The proportion of hydrochloric acid which causes the greatest activity is by no means the same for all pepsins; the optimum acidity was found to be lower for pepsin from the pig than for that from the dog, while human pepsin showed its greatest activity with a still higher acidity. If pepsin from the dog is rendered inactive by means of alkali it partly recovers its activity on re-acidifying, but this was only found to occur in some cases with human or pig pepsin. If trypsin is rendered inactive by the addition of acid it does not recover its activity on neutralising or rendering alkaline.—D. Lenard (*Biochem. Ztschr.*, 1914, 60, 43 ; through *Apoth. Zeit.*, March 11, 1914, 203).—*Pharmaceutical Journal.*

ARMY VETERINARY SERVICE

Extract from *London Gazette*,

WAR OFFICE, WHITEHALL, Sept. 1.

REGULAR FORCES. ARMY VETERINARY CORPS.

The following to be temporary Lieuts. :—
W. D. Halfhead. Dated Aug. 17.
H. A. Idenden. Dated Aug. 18.

Special Reserve of Officers.
Supplementary to Regular Units or Corps.

ARMY VETERINARY CORPS.

J. FOX, M.R.C.V.S., to be Lieut. (on probation). Dated Aug. 29.

C. J. C. Ryan, from Royal Veterinary College of Ireland, to be Sec. Lieut. (on probation). Dated Aug. 18.

TERRITORIAL FORCE. ARMY VETERINARY CORPS.

Lieut. J. S. Bowden to be Capt. Dated May 29.
Lieut. H. Peele to be Capt. Dated Aug. 19.
G. D. Martin to be Capt. Dated Sept. 2.
H. H. Lord to be Lieut. Dated Aug. 6.
J. Southall to be Lieut. Dated Aug. 22.
P. S. Thierry to be Lieut. Dated Aug. 9.

September 4.

Special Reserve of Officers.
Supplementary to Regular Corps or Units.

ARMY VETERINARY CORPS.

The following is substituted for that which appeared in *The Gazette*, dated Aug. 29 and Sept. 1 respectively :

L. A. Auchterlonie to be Lieut. (on probation). Dated Aug. 18.

C. J. C. Ryan, from Royal Veterinary College of Ireland, to be Lieut (on probation). Dated Aug. 18.

TERRITORIAL FORCE. ARMY VETERINARY CORPS.

The following to be Lieuts. :—W. F. Morton, R. J. Sargent, C. W. Townsend, R. L. Armour, H. Newton. Dated Sept. 5.

F. Douthwaite (late Vet.-Capt. I.Y.) to be Capt. Dated Sept. 5.

The date of appointment of G. W. Bloxsome as a Lieut. in the Army Veterinary Corps is Aug. 5, and not as stated in *The Gazette* of Aug. 18.

B. J. Rees to be Lieut. Dated Sept. 5.

Sept. 8

Special Reserve of Officers.

REGULAR FORCES. ARMY VETERINARY CORPS.

W. A. L. Buchanan from Royal Veterinary College of Ireland to be Lieut. (on probation). Dated Aug. 31.

D. C. Greene, from Royal Veterinary College of Ireland, to be Lieut. (on probation). Dated Aug. 31.

TERRITORIAL FORCE. ARMY VETERINARY CORPS.

A. J. Beckett to be Lieut. Dated Sept. 9.
F. B. Greer to be Lieut. Dated Sept. 9.
E. Morgan to be Lieut. Dated Sept. 9.
Lieut. J. R. Crone to be Capt. Dated Aug. 26.

INDIA OFFICE, Sept. 8.

INDIAN CIVIL VETERINARY DEPARTMENT.

The King has approved the retirement of the following:

* * *

Lieut.-Col. H. M. Maxwell, F.R.C.V.S., Dated July 29.

Personal.

Mr. JOHN BLAKEWAY, F.R.C.V.S., of Bluntington House, Chaddesley Corbett, Kidderminster, has accepted an appointment under the War Office, and is shortly leaving for Canada.

OBITUARY

HARRY DORRINGTON FRITCHARD, M.R.C.V.S., Wolverhampton. Graduated, Lond: April, 1863.

At an inquest held on Thursday, 3rd inst., Dr. A. M. Bankier stated that on Aug. 4th deceased sustained a fall on the steps leading to his house, and fractured his kneecap. His aged sister was alone in the house at the time and was quite unfit to attend the court and give evidence. Witness was away at the time, but took the case over on his return after deceased had consulted several doctors. On Aug. 24th delirium set in, and deceased died on Wednesday from exhaustion.

The Coroner said "He was considered a wonderful man for his years, and rode to hounds only last winter. His father died not long since at the age of 100."

The jury returned a verdict of "Accidental death."

Mr. Pritchard was a very old and well-known resident of Wolverhampton, and was highly respected by all who knew him. His professional career in the town had extended over a long period of years, and he was one of the oldest followers of the Albrighton Hunt. Although well over 70 years of age he, up to the time of his fatal accident, exhibited an activity, and sprightliness that would have been creditable to a much younger man. His cheery and amiable disposition won him many friends, and he was in brief a real Englishman, a staunch Conservative and churchman.

The late Mr. Pritchard was a son of Mr. Richard Pritchard, who was an Examiner for the Membership R.C.V.S. 1859-77, member of Council 1848-64 and 1865-77, and Vice-President 1864: and a brother of Prof. William Pritchard, F.C.S., who was Member of Council 1868-92 and 1895-1900, and Examiner for the Membership 1882-88.

THE URGENT CALL FOR VETERINARY SURGEONS.

Sir,

There has been much controversy of late in *The Record*, regarding the urgent call for veterinary surgeons. As you are aware, final-year students in many instances are acting as locums, thus enabling qualified men to go to the front. These men are rendering considerable service to the country, as without their assistance the practitioner could not well leave his practice and would thus be prevented from helping his country, and the question arises, how are they to be dealt with so that their future prospects may not be injuriously affected by the date of their final qualification being indefinitely delayed. Supposing the war lasts three years these assistants who have filled the places of those who have gone to the front will return to college and find that men who have attended college will be senior to them in every way. The majority of them being too old for the Army or other appointments and a great many men enter the veterinary profession solely for the Army.

Is the gentleman who signs himself "Fallen Pedestal" aware that veterinary surgeons who have been called to the front have been unable to obtain even second and third year men, and have had to leave their practices unguarded. When the assistants entered into agreements to act indefinitely as locums, they considered it their duty to do so, and it would be interesting to hear what opinions there are on the question raised in this letter, and no doubt your influential paper will take up the case of those concerned, so that they may not be penalised for the course they have, under a sense of duty, adopted.—Yours etc.,

"FINAL YEAR R.V.C.I."

Sir,

Class D student in his letter on the above in last week's issue of your paper, has evidently misunderstood my letter on this matter. I quite agree (and I have never alleged otherwise) that they (Class D students) are entitled to their diplomas, but I fail to see why it would be of such a great advantage in the matter of acting as locum for a practitioner called up for service. I was quite aware that the closing of the Colleges would be disadvantageous not only to Class D men, but also to all other years, as all qualifications would be suspended. One might have modified the statement by suggesting that those students who were willing and could afford to suspend attendance, in order to serve their country, should be granted leave of absence by the Principal of their respective college, in the same way as the Universities of Oxford and Cambridge are doing. Those who could not afford to do this, or who preferred to study rather than fight or learn practical knowledge, could go on as if it was 1913 and not 1914. Some of us (and the writer is one) hope to be able to fight for our country besides doing a small job such as remount business, and we should like to know at once if we shall be able to rely on having assistance, and further, if such courses as Post-graduate will or will not be held at present, so that we can frame our plans accordingly.

It seems almost superfluous to expect that a post-graduate class will be practicable for the present, but no information regarding its date, or its postponement has appeared.

I quite disagree with an emergency examination. It would be unfair to the candidates, and to those who have already passed the examination (some after a considerable time of waiting—six months or more after rejection).

Those students who would care (or have) to serve their country, should be granted leave from College and incur no further expense beyond the fees already paid.

We should like to see some official announcement soon, and not be driven to within a day of the proposed date, and then receive word that "it is off."—Yours faithfully,

M.R.C.V.S.